EGU23-1088, updated on 28 Mar 2024
https://doi.org/10.5194/egusphere-egu23-1088
EGU General Assembly 2023

Lessons learned from catchment observatory and network design in the UK, rest of Europe and North-America

Gemma Coxon[1], John P Bloomfield[2], Wouter Buytaert[3], Matt Fry[4], Gareth Old[4], and Thorsten Wagener[5]

[1]Geographical Sciences, University of Bristol, United Kingdom
[2]British Geological Survey, Wallingford, United Kingdom
[3]Civil and Environmental Engineering, Imperial College, United Kingdom
[4]UK Centre for Ecology and Hydrology, Wallingford, United Kingdom
[5]Institute for Environmental Sciences and Geography, University of Potsdam, Germany

Many countries fund catchment observatories and networks to provide observational data, test models and hypotheses, discover new insights, catalyse the development of new technologies and enhance interdisciplinary collaboration. These catchment networks provide a wealth of observational data, yet synthesising information across catchment observatories to produce process-based understanding is challenging. To generalise findings from place-based studies, we need greater synthesis across catchment networks and thus careful consideration of the design and topology of catchment observatories and monitoring networks.

In this paper, we collate information from 80 catchment observatories/networks and conduct 21 questionnaires with project leads with the aim of reviewing the strengths and weaknesses of catchment observatories to provide recommendations that can inform future catchment observatory and network design. The catchment observatories encompass a wide range of flow regimes, science questions and spatial/temporal scales with 25, 33 and 22 observatories from the UK, Europe, and North America respectively. Most catchment observatories in the monitoring catalogue are concentrated in upland catchment systems monitoring flashy flow regimes, with very few focused on lowland systems and no catchment observatories focused on urban catchments. The choice of catchment observatory location was focused upon logistics and catchment characteristics, with logistics and the day-to-day running of the observatory highlighted as the aspect catchment observatory programme managers found most difficult. Many interviewees noted that the design of the observatory was a key phase in planning and an aspect they would have done differently.

Finally, we recommend key design guidelines for future catchment observatory and networks. This includes the need for a scoping and planning phase, community co-designed, digital infrastructure that enables FAIR data provision, and flexible and extensible catchment topology. Critically, knowledge transfer needs to be built in from the beginning of catchment observatories to enable transferability of new insights and understanding across linked catchment networks to tackle

grand challenges within hydrology.